PATENT COOPERATION TREATY

06 JAN 2004

From the RECEIVING OFFICE

To:
Mr B.D. Stoole
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SO16 7NS

CONFIRMATION

PCT

INVITATION TO CORRECT DEFECTS IN
THE INTERNATIONAL APPLICATION

(PCT Articles 3(4)(i) and 14(1) and Rule 26)

Date of mailing *(day/month/year)*	**0 3 JAN 2004**

Applicant's or agents's file reference 101.0049PCT	**REPLY DUE** within 2 months/~~days~~ from the above date of mailing

International application No. PCT/GB2003/005372	International filing date *(day/month/year)* 11/12/2003

Applicant
SENSOR HIGHWAY LIMITED et al

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1. ☑ The applicant is hereby **invited**, within the time limit indicated above, to correct, in the international application as filed , the defects specified on the attached

    ☑ Annex A

    ☑ Annex B1 *(text matter of the international application as filed)*

    ☐ Annex C1 *(drawings of the international application as filed)*

2. ☐ The applicant is hereby **invited**, within the time limit indicated above, to correct, in the translation of the international application furnished under Rule 12.3 or 12.4, the defects specified on the attached.

    ☐ Annex A

    ☐ Annex B2 *(text matter of the translation of the international application)*

    ☐ Annex C2 *(drawings of the translation of the international application)*

Additional observations (if necessary):

HOW TO CORRECT THE DEFECTS?

Correction must be submitted by filing a replacement sheet embodying the correction and a letter accompanying the replacement sheet, which shall draw attention to the difference between the replaced sheet and the replacement sheet. A correction may be stated in a letter only if it is of such a nature that it can be transferred from the letter to the record copy without adversely affecting the clarity and direct reproducibility of the sheet onto which the correction is to be transferred (Rule 26.4).

ATTENTION

Failure to correct the defects will result in the international application being considered withdrawn by this receiving Office (see Rule 26.5 for further details).

A copy of this invitation and any attachments has been sent to the International Bureau
☑ and the International Searching Authority

Name and mailing address of the receiving Office	Authorized officer
The Patent Office Cardiff Road, Newport South Wales NP10 8QQ Facsimile No.	LYN WHITE Telephone No. 01633 814384

International application No.
PCT/GB2003/005372

The receiving Office has found the following defects in the international application as filed:

1. As to **signature*** of the international application (Rules 4.15 and 90.4), the request:

   a. ☐ is not signed.

   b. ☐ is not signed by all the applicants.

   c. ☐ is not accompanied by the statement referred to in the check list in Box No. VIII of the request explaining the lack of the signature of an applicant for the designation of the United States of America.

   d. ☑ is signed by what appears to be an agent/common representative but

       ☑ the international application is not accompanied by a power of attorney appointing him

       ☐ the power of attorney accompanying the international application was not signed by all applicants.

   e. ☐ other *(specify):*

   * All applicants must sign, including inventors if they are also applicants (e.g. where the United States of America is designated).

2. As to indications concerning the **applicant,** the request (Rules 4.4 and 4.5):

   a. ☐ does not properly indicate the applicant's name *(specify):*

   b. ☐ does not indicate the applicant's address.

   c. ☐ does not properly indicate the applicant's address *(specify):*

   d. ☐ does not indicate the applicant's nationality.

   e. ☐ does not indicate the applicant's residence.

   f. ☐ other *(specify):*

3. As to the **language** of certain elements of the international application, other than the description and claims (Rules 12.1(c) and 26.3 *ter(a) and (c)):*

   a. ☐ the request is not in a language of publication accepted by this receiving Office; (the) language(s) accepted by this receiving Office is/are:

   b. ☐ the **text matter of the drawings** is not in a language in which the international application is to be published, which is:

   c. ☐ the abstract is not in the language in which the international application is to be published, which is:

4. The **title** of the invention:

   a. ☐ is not indicated in Box No. 1 of the request (Rule 4.1(a)).

   b. ☐ is not indicated at the top of the first sheet of the description (Rule 5.1(a)).

   c. ☐ as appearing in Box No. 1 of the request is not identical with the title heading the description (Rule 5.1(a)).

5. As to the **abstract** (Rule 8):

   a. ☐ the international application does not contain an abstract.

International application No.
PCT/GB2003/005372

This receiving Office has found that, with regard to the presentation of the **text matter of the international application as filed,** the physical requirements are not complied with to the extent that compliance therewith is necessary for:

1. ☑ reasonably uniform international publication (Rules 11 and 26.3(a)(i)) *(defects to be specified):*

			Request	Description	Claims	Abstract
a. ☐	The sheets do not admit of direct reproduction		☐	☐	☐	☐
b. ☐	The element does not commence on a new sheet.		☐	☐	☐	☐
c. ☐	Sheets are not free from creases, cracks, folds.		☐	☐	☐	☐
d. ☐	Sheets are not used in the upright position.		☐	☐	☐	☐
e. ☐	One side of the sheets is not left unused.		☐	☐	☐	☐
f. ☐	The paper of the sheets is not flexible/strong/white/smooth/non-shiny/durable.	☐	☐	☐	☐
g. ☐	The sheets are not connected as prescribed (Rule 11.4(b)).		☐	☐	☐	☐
h. ☐	Sheets are not A4 size (29.7cm x 21cm).		☐	☐	☐	☐
i. ☐	The minimum margins on the sheets are not as prescribed (top: 2cm; left side: 2.5cm; right side: 2cm; bottom:2cm).			☐	☐	☐
j. ☐	The file reference number indicated on the sheets does not appear in the left-hand corner of the sheets, within 1.5cm of the top of the sheets.			☐	☐	☐
k. ☐	The file reference number exceeds the maximum of 12 characters.		☐	☐	☐	☐
l. ☐	The sheets of the description, claims and abstract are not numbered in consecutive Arabic numerals..			☐	☐	☐
m. ☐	The sheet numbers are not centered at the top or bottom of the sheets.		☐	☐	☐	☐
n. ☐	The sheet numbers are in the margin (see i. above for the size of the margins).			☐	☐	☐
o. ☐	The text matter is not typed or printed.		☐	☐	☐	☐
p. ☐	The typing on the sheets is not 1½-spaced.			☐	☐	☐
q. ☐	The characters in the text matter on the sheets are less than 0.21 cm high in capital letters.		☐	☐	☐	☐
r. ☐	The text matter on the sheets is not in dark, indelible colour.		☐	☐	☐	☐
s. ☐	The element contains drawings.		☐	☐	☐	☐
t. ☐	The sheets contain alterations/overwritings/interlineations/too many erasures.		☐	☐	☐	☐
u. ☐	The sheets contain photocopy marks.		☐	☐	☐	☐

2. ☐ satisfactory reproduction (Rules 11 and 26.3(b)(i)).

Further observations (if necessary):

✳ CLAIM NUMBER 13 IS MISSING.

5.   The system of claim 1, wherein the optical signal is subject to a level of modulation

instability that enables the proper measurement of the information-carrying signal.

6.   The system of claim 1, wherein the parameter comprises at least one of temperature,

5   strain, pressure, distributed temperature, distributed strain, distributed pressure, flow, density,

resistivity, acoustic pressure, acceleration, or chemical properties.

7.   The system of claim 1, wherein the fiber transmits the information-carrying signal

from a sensor.

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8.   The system of claim 7, wherein the sensor is an intrinsic sensor.

9.   The system of claim 7, wherein the sensor is an extrinsic sensor.

15   10.   The system of claim 1, wherein the fiber is adapted to sense the parameter.

11.   The system of claim 1, wherein the information-carrying signal comprises Brillouin

scattering.

20   12.   The system, of claim 1, wherein the remote location comprises one of a wellbore, a

pipeline, an electrical power cable, an industrial process, a fire alarms, a tunnel, or a

structure.

13.   The system of claim 1, wherein the fiber is housed in a conduit.

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14.   The system of claim 13, wherein the fiber is pumped into the conduit.

15.   The system of claim 1, wherein the fiber is a dispersion shifted fiber.

5   16.   The system of claim 1, wherein the fiber is operated at wavelengths shorter than the

wavelength of zero dispersion.

17.   The system of claim 16, wherein the fiber is operated at wavelengths that are longer

than a second mode cut-off wavelength.

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18.   A method for sensing a parameter in a remote location, comprising:

providing a fiber;

carrying an optical signal through the fiber from a starting location towards a remote

location;

15   operating the fiber in a region of negative chromatic dispersion;

carrying the optical signal at a power level sufficient to generate modulation

instability if the fiber were operated in a region of positive chromatic dispersion

sensing a parameter in the remote location; and

transmitting at least one information-carrying signal through the fiber from the remote

20   location towards the starting location, the information-carrying signal carrying information

related to the parameter.

19.   The method of claim 18, further comprising connecting an opto electronic unit to the

fiber.

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20.   The method of claim 18, further comprising extracting the information from the information-carrying signal.

21.   The method of claim 18, wherein the carrying step comprises carrying the optical signal so that the optical signal is subject to a level of modulation instability that does not inhibit a proper measurement of the information-carrying signal.

22.   The method of claim 18, wherein the carrying step comprises carrying the optical signal so that the optical signal is subject to a level of modulation instability that enables the proper measurement of the information-carrying signal.

23.   The method of claim 18, wherein the parameter comprises at least one of temperature, strain, pressure, distributed temperature, distributed strain, distributed pressure, flow, density, resistivity, acoustic pressure, acceleration, or chemical properties.

24.   The method of claim 18, wherein the sensing step comprises sensing the parameter with a sensor and the transmitting step comprises transmitting the information-carrying signal from the sensor.

25.   The method of claim 24, wherein the sensor is an internal sensor.

26.   The method of claim 24, wherein the sensor is an external sensor.

27.   The method of claim 18, wherein the sensing step comprises sensing the parameter with the fiber.

28.   The method of claim 18, wherein the information-carrying signal comprises Brillouin scattering.

5   29.   The method of claim 18, wherein the remote location comprises one of a wellbore, a pipeline; an electrical power cable, an industrial process, a fire alarms, a tunnel, or a structure.

30.   The method of claim 18, further comprising housing the fiber in a conduit.

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31.   The method of claim 30, further comprising pumping the fiber into the conduit.

32.   The method of claim 18, wherein the fiber is a dispersion shifted fiber.

15   33.   The method of claim 18, further comprising operating the fiber at wavelengths shorter than the wavelength of zero dispersion.

34.   The method of claim 33, further comprising operating at wavelengths that are longer than a second mode cut-off wavelength.

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